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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/12/2001

Bernhard Erich Hermann Claus

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11/28/2005

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EXAMINER

CHEN, WENPENG

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,621

Applicant(s)

CLAUS ET AL.

Examiner

Wenpeng Chen

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 4-12, 17-25 and 30-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 13-16, 26-29, 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Examiner's responses to Applicant's remark

1. Applicants' amendments filed on 8/12/2005 overcome the following(s) set forth in paper # 20050506 mailed 5/13/2005.

2. Applicants' arguments filed on 8/12/2005 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference to reasonably and properly meet the claimed limitation.

a. Applicants' argument -- (1) As described in Webber, the non-linear combination (minimization) is preferred over linear combination (backprojection) as the non-linear combination reduces blurring artifacts. Applicants alleged that there is no teaching or suggestion that the backprojected data are being further processed via a non-linear operator as claimed in the present application. In fact, Webber teaches that one skilled in the art may not need a backprojection technique at all and may just rely on the non-linear combination of the projection images to generate tomosynthesis image for diagnosis. (2) Additionally, Webber only discloses minimum and maximum non-linear operators. Weber never discloses or teaches any other types of non-linear operators, such as those claimed in the present application. (3) At least because Webber does not disclose or suggest a technique that involves processing the backprojected data using a non-linear operator as claimed in the present application, the reference cannot support a prima facie case of anticipation of claims 1, 13, 14 or 26.

Art Unit: 2625

Examiner's response -- The Examiner disagrees with the above conclusions. With regard to points (1) and (3), as shown in the Examiner's cited portion, Webber teaches in Fig. 24B generating backprojected data from elements 1146 and 1148 into their corresponding addresses or locations. The backprojected data are then processed with a non-linear operator to generate a 3D data set. It does not teach processing the result generated with a linear operator and then further processing the linear-operated results with another non-linear operator. As far as the features recited in claims 1, 13, 14 or 26 are concerned, Webber teaches every recited limitations. The Applicant's argument is irrelevant to the claimed limitations.

With regard to point (2), the involved claims such as Claim 13 recites an alternative-limitation format. As long as Webber teaches one of the listed limitations such as maximum operator, Webber reference meets the limitation.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 13, 14-16, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Webber (US patent 6,081,577.)

Art Unit: 2625

For Claims 1-3, Webber teaches a method for reconstructing a three-dimensional dataset representative of an imaged object (abstract; column 4, lines 17-31), said method comprising:

-- acquiring views of an object from at least two projection angles with an imaging system including at least one radiation source and at least one detector array to generate a projection dataset of the object; (Figs. 1 and 24B; column 13, lines 44-51; column 14, lines 58-64; column 22, line 9 to column 23, line 19; Element 27 can be an x-ray source. Recording medium can be a CCD that is the detector array.)

-- backprojecting the views across an imaged volume to generate backprojected data; (Figs. 2,3, and 24B; column 22, line 9 to column 23, line 19)

-- processing the backprojected data using a non-linear operator to generate a three-dimensional dataset consisting of a plurality of images representative of the imaged object; (Figs. 2,3, and 24B; column 22, line 9 to column 23, line 19; Both Figs. 24A and 24 B teach backprojection.)

-- wherein acquiring views of an object from at least two projection angles with an imaging system comprises acquiring views of an object with one of a computed tomography (CT) detector array, a mammographic detector array, and a chest detector array; (column 22, lines 49-64; column 27, line 54 to column 28, line 13; column 28, lines 32-40)

-- wherein processing the backprojected data using a non-linear operator comprises projections yielding maximum are selected. (column 23, lines 10-19)

For Claim 13, Webber teaches a method for reconstructing a three-dimensional dataset representative of an imaged object (abstract; column 4, lines 17-31), said method comprising:

Art Unit: 2625

-- acquiring views of an object from at least two projection angles with a medical imaging system including at least one radiation source and at least one detector array to generate projection data of the object, wherein said at least one detector array comprises one of a computed tomography (CT) detector array, a chest detector array and a mammographic detector array; (Figs. 1 and 24B; column 13, lines 44-51; column 14, lines 58-64; column 22, line 9 to column 23, line 19; column 22, lines 49-64; column 27, line 54 to column 28, line 13; column 28, lines 32-40; Element 27 can be an x-ray source. Recording medium can be a CCD that is the detector array.)

-- backprojecting the views across an imaged volume; (Figs. 2,3, and 24B; column 22, line 9 to column 23, line 19)

-- processing the backprojected data using a non-linear operator to generate a three-dimensional dataset consisting of a plurality of medical images representative of the imaged object; (Figs. 2,3, and 24B; column 22, line 9 to column 23, line 19; Both Figs. 24A and 24 B teach backprojection.)

-- wherein said non-linear operator comprises **one** of a maximum operator, a minimum operator, a generalized average operator, a binary operator, a monotonic operator, a median operator and a generalized median operator according to the equations recited in Claim 13. (column 23, lines 10-19; Fig. 23; column 23, line 20 to column 24, line 17)

For Claims 14-16, Webber teaches a medical imaging system for reconstructing a three-dimensional dataset representative of an imaged object (abstract; column 4, lines 17-31), said medical imaging system comprising:

-- a detector array; (element 31 of Fig. 1)

Art Unit: 2625

-- at least one radiation source; (element 27 of Fig. 1)

-- a computer coupled to said detector array and radiation source (column 16, lines 1-6;

Webber teaches that each step shown in Fig. 2 can be performed as part of a computer-executed process. Inherently, a computer is coupled to the source at least at step 49 of Fig. 2, to the detector array at step 51 of Fig. 2.) and configured to:

-acquire views of an object from at least two projection angles to generate projection data of the object; (Figs. 1 and 24B; column 13, lines 44-51; column 14, lines 58-64; column 22, line 9 to column 23, line 19; Element 27 can be an x-ray source. Recording medium can be a CCD that is the detector array.)

- backproject the views across an imaged volume; (Figs. 2,3, and 24B; column 22, line 9 to column 23, line 19)

- process the backprojected data using a non-linear operator to generate a three-dimensional dataset consisting of a plurality of medical images representative of the imaged object; (Figs. 2,3, and 24B; column 22, line 9 to column 23, line 19; Both Figs. 24A and 24 B teach backprojection.)

-- wherein said detector array comprises at least one of a computed tomography (CT) detector array, a chest detector array, and a mammographic detector array; (column 22, lines 49-64; column 27, line 54 to column 28, line 13; column 28, lines 32-40)

-- wherein to process the backprojected data using a non-linear operator, said computer further configured to process the backprojected data using a maximum operator. (column 23, lines 10-19; The computer is configured to perform at least steps 60-92 that including the backprojection process.)

Art Unit: 2625

For Claim 26, Webber teaches a medical imaging system for reconstructing a three-dimensional dataset representative of an imaged object (abstract; column 4, lines 17-31), said medical imaging system comprising:

- a detector array, said detector array comprising at least one of a computed tomography (CT) detector array, a chest detector array, and a mammographic detector array; (element 31 of Fig. 1; column 22, lines 49-64; column 27, line 54 to column 28, line 13; column 28, lines 32-40)

- at least one radiation source; (element 27 of Fig. 1)

- a computer coupled to said detector array and radiation source (column 16, lines 1-6; Webber teaches that each step shown in Fig. 2 can be performed as part of a computer-executed process. Inherently, a computer is coupled to the source at least at step 49 of Fig. 2, to the detector array at step 51 of Fig. 2.) and configured to:

- acquire views of an object from at least two projection angles to generate projection data of the object; (Figs. 1 and 24B; column 13, lines 44-51; column 14, lines 58-64; column 22, line 9 to column 23, line 19; Element 27 can be an x-ray source. Recording medium can be a CCD that is the detector array.)

- backproject the views across the imaged volume; (Figs. 2,3, and 24B; column 22, line 9 to column 23, line 19)

Art Unit: 2625

-- process the backprojected data using a non-linear operator to generate a three-dimensional dataset consisting of a plurality of medical images representative of the imaged object, wherein said non-linear operator comprises one of a maximum operator, a minimum operator, a generalized average operator, a binary operator, a monotonic operator, a median operator recited in Claim 26, and a generalized median operator recited in Claim 26. (Figs. 2,3, 23, and 24B; column 22, line 9 to column 23, line 19; column 23, line 20 to column 24, line 17; Both Figs. 24A and 24 B teach backprojection. The computer is configured to perform at least steps 60-92 that including the backprojection process.)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 27-29 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webber (US patent 6,081,577) as applied to Claims 1-3 and 13 as discussed above, and further in view of Stanton et al. (US patent 6,744,848.)

Webber, as discussed above, teaches the corresponding method claims 1-3 and 13 of Claims 27-29 and 39. However, Webber does not explicitly teach a computer readable medium as recited in the claims.

Art Unit: 2625

Stanton teaches a computer readable medium and a computer program for controlling a 3D imaging system. (column 7, lines 41-65; column 12, lines 54-64; memory 56 of Fig. 3)

It is desirable to make a processing method portable from a computer to another computer. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to store the processing steps of the method taught by Webber in a computer readable medium taught by Stanton, because the combination makes the processing method portable and therefore increase its application.

Conclusion

7. THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). The Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

Art Unit: 2625

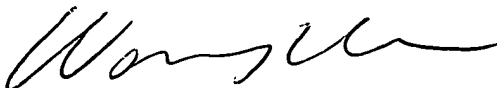
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 571-272-7431. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 571-273-8300 for After Final communications. TC 2600's customer service number is 571-272-2600.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Wenpeng Chen

Primary Examiner, 2625



November 22, 2005